

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of	)	Examiner: S. SINGH
Redert et al.	)	
	)	Art Unit: 2625
Serial No.: 10/542,137	)	
	)	Confirmation: 8348
Filed: July 12, 2005	)	
	)	
<b>For: Full Depth Map Acquisition</b>	)	
	)	
	)	
Date of Examiner's Answer:	)	
April 12, 2010	)	
	)	
Attorney Docket No.:	)	
NL030006	)	May 14, 2010

Commissioner For Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**REPLY BRIEF**

Dear Sir:

This Reply Brief is responsive to the Examiner's Answer of April 12, 2010. This Brief addresses arguments and evidence relied upon in the Appeal Brief that the examiner did not directly answer.

**EXAMINER'S ANSWER SECTIONS (1)-(9)**

The Appellant and the Examiner appear to be in agreement concerning Sections I - VI and IX of the Appeal Brief and the corresponding

sections (1) – (7) of the Examiner’s Answer. Section (9) of the Examiner’s answer repeats verbatim (to include typographical errors) the same “grounds of rejection” that were made in the June 16, 2009 Final Office Action.

#### **EXAMINER’S ANSWER SECTION (10) – RESPONSE TO ARGUMENT**

The appellant hereby wishes to point out arguments relied upon in the Appeal Brief that the examiner did not directly answer. These primarily relate to each of the independent claims reciting “a) acquiring at least one image of said 3-D scene using less than three cameras.” Appellants submit that the Medioni teaching of developing a 3D face model differs from claim 1’s analysis of a 3D scene. The examiner has addressed this feature of the claim and the Appellants’ argument by repeatedly emphasizing that Medioni uses a single camera and essentially ignored the claimed feature that the image is of a 3D scene.

There are significant differences between analysis of an essentially unknown 3D scene and the analysis of a human face in which facial features are known to be present and merely have to be identified. By way of example paragraph the specification at page 7, lines 8-16 recites:

In FIG. 1b a qualitative processing of depth information is depicted. Objects 2a, 2b, and 2c are captured by camera 10. Image segmentation and T-shape detection is carried out on the captured image. By qualitative processing 12, depth discontinuities 14 at the position 13 within the image, maybe determined. The direction of the first

discontinuity 14a is not known. The direction of the following discontinuities 14b, 14c is known. By image segmentation 12a, the shape of the objects may also be extracted, revealing two hexagons 2a , 2c and a wall 2b. The qualitative processing reveals that hexagon 2c is in front of hexagon 2a , and in front of wall 2b. The resultant depth information is incomplete. It comprises derivatives of depth values.

As illustrated above, such a scene analysis includes determinations of objects and how the occlude one another.

Moreover, acquiring images of such a 3D scene is not performed by having the scene rotate in front of the camera, as required by Medioni. Thus, appellants respond to the examiner's argument that "there is nothing in the claimed language that requires that the image being acquired for the 3-D scene should [sic] dynamic and not static as argued by the appellant" (last sentence, Page 6 of Examiner's Answer) by noting that it is inherent in analysis of a 3D scene that the scene does not rotate in front of a fixed camera – contrary to the teachings of Medioni. Accordingly, Medioni fails to teach acquiring at least one image of said 3-D scene using less than three cameras as recited in claim 1 of the present invention.

Further, the examiner addresses the feature "b) acquiring partial depth map from at least one image" by pointing to col. 5 lines 13-32 of Medioni and in particular quoting lines 22-24: "then, two adjacent views are treated as a stereo

pair and used to generate partial depth map.” Appellants quote below the entire reference passage (col. 5, lines 13-32) with emphasis added:

The present invention pertains to techniques for generating fully-textured 3D model of a human face using a single camera. A user who desires to generate a 3D model of his/her face **needs only to rotate his/her head in front of the camera** that produces a sequence of image frames. The image frames are provided to a computing device that is loaded with an executable module of the present invention. The executable module is configured to proceed with a two-stage process. **First, the pose of the face in each of the image frames is estimated with respect to the camera. This is accomplished by feature matching and global bundle adjustment.** Then, two adjacent views are treated as a stereo pair and used to generate partial depth maps that are then integrated into a single 3-D model. Alternatively, a 3D mesh is generated incrementally by triangulating the matched or tracked feature points, using the computed camera pose. Subsequently, the mesh is textured with reference to one or more of the image frames. One of the advantages in the present invention is a modeling mechanism that can be easily deployed, for example, in a home computer with a web camera to generate a fully-textured 3D model of a user's face.

As emphasized above, Medioni addresses analysis of a face and fails to teach analysis of a 3D scene -- where features and objects are unknown and in which the scene inherently does not rotate in front of the camera.

Thus, as indicated in the Appeal Brief, appellants respectfully submit that the rejection of independent claims 1 and 12 under 35 U.S.C. 102(e) as being

anticipated by Medioni (U.S. Pat. No. 7,103,211) is in error as the reference fails to show a limitation cited in the independent claims.

As noted in MPEP § 2131, it is well-founded that “A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Further, “The identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Since Medioni does not teach all of the limitations of independent claims 1 and 12, it cannot anticipate the present invention. For at least the above cited reasons, Appellant submits that Claims 1 and 12 are patentable over Medioni.

With regard to claims 2-10 these claims depend from independent claim 1 discussed above, which has been shown to be allowable in view of the cited reference. Accordingly, each of claims 2-10 also allowable by virtue of its dependence from an allowable base claim.

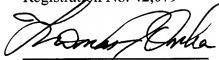
**CONCLUSION**

For the reasons set forth above, in the Appeal Brief, and in the Reply Brief, it is submitted that no claims are anticipated by any of the references of record and that all claims are patentable over the references of record.

An early Decision reversing the Examiner's rejection of all claims is requested.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read 'Thomas J. Onka', written over a horizontal line.

By: Thomas J. Onka  
Attorney for Appellant  
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Date: May 14, 2010